



Collective Teacher Efficacy: Its Meaning, Measure, and Impact on Student Achievement

Author(s): Roger D. Goddard, Wayne K. Hoy, Anita Woolfolk Hoy

Source: *American Educational Research Journal*, Vol. 37, No. 2 (Summer, 2000), pp. 479-507

Published by: American Educational Research Association

Stable URL: <http://www.jstor.org/stable/1163531>

Accessed: 14/08/2010 05:30

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/action/showPublisher?publisherCode=aera>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



American Educational Research Association is collaborating with JSTOR to digitize, preserve and extend access to *American Educational Research Journal*.

<http://www.jstor.org>

Collective Teacher Efficacy: Its Meaning, Measure, and Impact on Student Achievement

Roger D. Goddard

University of Michigan

Wayne K. Hoy and Anita Woolfolk Hoy

The Ohio State University

This article is a theoretical and empirical analysis of the construct of collective teacher efficacy. First, a model of collective efficacy was elaborated for use in schools. Then, an operational measure of collective teacher efficacy was developed, tested, and found to have strong reliability and reasonable validity. Finally, using the instrument to examine urban elementary schools in one large midwestern district, collective teacher efficacy was positively associated with differences between schools in student-level achievement in both reading and mathematics.

ROGER D. GODDARD is an Assistant Professor in the School of Education, University of Michigan, 610 E. University, 4204 SEB, Ann Arbor, MI 48109–1259; rgoddard@umich.edu. He specializes in organizational theory and educational administration.

WAYNE K. HOY is the Fawcett Chair in Educational Administration, School of Educational Policy and Leadership, College of Education, The Ohio State University, Ramseyer Hall, 29 West Woodruff Avenue, Columbus, OH 43210; waynehoy@aol.com. He specializes in organizational theory and educational administration.

ANITA WOOLFOLK HOY is a Professor in the School of Educational Policy and Leadership, College of Education, The Ohio State University, Ramseyer Hall, 29 West Woodruff Avenue, Columbus, OH 43210; awoolfolk@aol.com. She specializes in teacher cognition and educational psychology.

One of the great challenges for those who study schools is to learn how school organizations contribute to students' academic success. Schools affect students and their achievement differentially. Identification of school characteristics associated with differences in student achievement is important to the development of effective schools. Bandura (1993, 1997) argued that one powerful construct that varies greatly among schools and that is systematically associated with student achievement is the collective efficacy of teachers within a school.

Collective teacher efficacy, the perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students, is based on Bandura's (1977, 1986, 1997) social cognitive theory, a unified theory of behavior change. Social cognitive theory is concerned with human agency, or the ways that people exercise some level of control over their own lives. Central to the exercise of control is sense of self-efficacy or "beliefs in one's capabilities to organize and execute a course of action required to produce a given attainment" (Bandura, 1997, p. 3). However, social cognitive theory acknowledges that "personal agency operates within a broad network of sociostructural influences" (p. 6) and thus the theory "extends the analysis of mechanisms of human agency to the exercise of collective agency" (p. 7)—people's shared beliefs that they can work together to produce effects.

As a self-referent perception of capability to execute specific behaviors, individual efficacy beliefs are excellent predictors of individual behavior. In fact, over the last 20 years, researchers have established strong connections between teacher efficacy and teacher behaviors that foster student achievement (Allinder, 1994; Ashton & Webb, 1986; Gibson & Dembo, 1984; Meijer & Foster, 1988; Woolfolk & Hoy, 1990). Although research has identified links between teachers' perceptions of their own efficacy and student achievement, collective teacher efficacy has received relatively little research attention (Bandura, 1993, 1997; Esselman & Moore, 1992; Newmann, Rutter, & Smith, 1989). Pajares (1997) suggested that studies of collective teacher efficacy are scant because of limits imposed by the intensive data collection required in the study of multiple schools. The purposes of this research are to extend the concept of teacher efficacy to the organizational level, to explore the theoretical nature of collective teacher efficacy, to develop a reliable and valid measure, and to examine the effects of collective teacher efficacy on student achievement. To better understand the concept of collective teacher efficacy, it is useful to examine what is known about individual teacher efficacy.

Teacher Efficacy

Over the last 20 years, the construct of teacher efficacy has evolved from Rotter's (1966) locus of control theory and Bandura's (1977, 1986, 1997) social cognitive theory. However, the meaning and measure of teacher efficacy has been the subject of considerable debate among scholars and

researchers (Ashton, Olejnik, Crocker, & McAuliffe, 1983; Gibson & Dembo, 1984; Guskey, 1987; Guskey & Passaro, 1994; Pajares 1996a, 1996b, 1997; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998).

Historical Perspectives

With the work of Rotter (1966) as a theoretical base, the researchers at the Rand Corporation studying the effectiveness of reading instruction first conceived of teacher efficacy as the extent to which teachers believed that they could control the reinforcement of their actions. The critical question was: Does control of reinforcement lay within the teachers themselves or in the environment? Student motivation and performance were assumed to be major sources of reinforcement for teachers. Hence, teachers who believed that they could influence student achievement and motivation were seen as assuming that they could control the reinforcement of their actions and thus having a high level of efficacy. A second conceptual strand of theory and research grew out of the work of Bandura (1977). He identified teacher efficacy as a type of self-efficacy—the outcome of a cognitive process in which people construct beliefs about their capacity to perform at a given level of competence. These beliefs affect how much effort people expend, how long they will persist in the face of difficulties, their resilience in dealing with failures, and the stress they experience in coping with demanding situations (Bandura, 1997).

The existence of the two separate but intertwined conceptual strands growing from two theoretical perspectives has contributed to some confusion about the nature of teacher efficacy. Some educators have assumed that Rotter's internal locus of control and Bandura's perceived self-efficacy are roughly the same. Bandura (1997) clarified the difference between these two concepts. Beliefs about one's capability to produce certain actions (perceived self-efficacy) are not the same as beliefs about whether actions affect outcomes (locus of control). Indeed, perceived self-efficacy and locus of control bear little or no empirical relationship with each other. Further, perceived self-efficacy is a much stronger predictor of behavior than locus of control. Rotter's scheme of internal-external locus of control is concerned primarily with causal beliefs about the relationship between actions and outcomes, not with personal efficacy. One may believe that a particular outcome is internally controllable, that is, caused by the actions of the individual, but still have little confidence that he or she can accomplish the desired actions.

An Integrated Model of Teacher Efficacy

In response to the conceptual confusion surrounding teacher efficacy and in keeping with the substantial body of research, Tschannen-Moran et al. (1998) proposed an integrated model of teacher efficacy. Consistent with social cognitive theory, the major influences on efficacy beliefs are assumed

to be the attributional analysis and interpretation of the four sources of information about efficacy described by Bandura (1986, 1997): mastery experience, physiological arousal, vicarious experience, and verbal persuasion. However, teachers do not feel equally efficacious for all teaching situations. Teacher efficacy is context specific. Teachers feel efficacious for teaching particular subjects to certain students in specific settings, and they can be expected to feel more or less efficacious under different circumstances. Even from one class period to another, teachers' level of efficacy may change (Ross et al., 1996). Therefore, in making an efficacy judgment, consideration of the teaching task and its context is required. In addition, it is necessary to assess one's strengths and weaknesses in relation to the requirements of the task at hand.

In analyzing (the teaching task and its context), the relative importance of factors that make teaching difficult or act as constraints is weighed against an assessment of the resources available that facilitate learning. In assessing (self-perceptions of teaching competence), the teacher judges personal capabilities such as skills, knowledge, strategies, or personality traits balanced against personal weaknesses or liabilities in this particular teaching context. The interaction of these two components leads to judgments about self-efficacy for the teaching task at hand. These same four sources of efficacy and the two dimensions of task analysis and teaching competence are included in our model of collective efficacy.

A Model of Collective Efficacy

Our formation of collective teacher efficacy builds on the self-efficacy formulation of Bandura (1997) and the model of teacher efficacy described above developed by Tschannen-Moran et al. (1998). Collective teacher efficacy is an emergent group-level attribute, the product of the interactive dynamics of the group members. As such, this emergent property is more than the sum of the individual attributes. It is "the groups' shared belief in its conjoint capabilities to organize and execute courses of action required to produce given levels of attainments" (Bandura, 1997, p. 477).

From Individual to Collective Efficacy: Conceptual Underpinnings

Teachers are members of school organizations. Their shared beliefs influence the social milieu of schools (Hoy & Miskel, 1996). Within an organization, perceived collective efficacy represents the shared perceptions of group members concerning "the performance capability of a social system as a whole" (Bandura, 1997, p. 469). Analogous to self-efficacy, collective efficacy is associated with the tasks, level of effort, persistence, shared thoughts, stress levels, and achievement of groups.

Collective efficacy as a property of schools. According to Bandura (1993, 1997), collective teacher efficacy is an important school property. One reason for this conclusion is the link between teacher efficacy and student

achievement (Anderson, Greene, & Loewen, 1988; Armor et al., 1976; Ashton & Webb, 1986; Ross, 1992, 1994). Just as individual teacher efficacy may partially explain the effect of teachers on student achievement, from an organizational perspective, collective teacher efficacy may help to explain the differential effect that schools have on student achievement. Collective teacher efficacy, therefore, has the potential to contribute to our understanding of how schools differ in the attainment of their most important objective—the education of students.

Bandura (1997) observed that because schools present teachers with a host of unique challenges involving public accountability, shared responsibility for student outcomes, and minimal control over work environments, the task of developing high levels of collective teacher efficacy is difficult but not impossible. Moreover, there is reason to believe that collective teacher efficacy, once developed, will thrive. At the collective level, efficacy beliefs are social perceptions. Putnam (1993) referred to such social features as moral resources that are strengthened rather than depleted through their use. The potential for efficacy to grow rather than to diminish through use is also indicated by the cyclic nature of efficacy implied by reciprocal causality (Bandura, 1997). That is, if collective efficacy gains enhance organizational performance, reciprocal causality suggests that resulting performance improvements may, in turn, strengthen collective organizational efficacy. Thus, to the extent collective teacher efficacy is positively associated with student achievement, there is strong reason to lead schools in a direction that will systematically develop teacher efficacy; such efforts may indeed be rewarded with continuous growth in not only collective teacher efficacy but also in student achievement.

Organizational agency and organizational learning. We assume that organizations learn (Cohen & Sproull, 1996; Senge, 1990) and base our notion of organizational learning on the cognitive activity of individual learning; that is, organizations use processes akin to learning in individuals (Cook & Yanon, 1996). One way to extend self-efficacy theory to the collective level is to apply the assumptions of social cognitive theory to the organizational level. A fundamental element of social cognitive theory is human agency. Extended to the school level, the parallel concept is organizational agency. Because agency refers to the intentional pursuit of a course of action, we may begin to understand school organizations as agentive when we consider that schools act purposefully in pursuit of their educational goals. For example, one school may be working to raise student achievement scores whereas another works to increase the rate and quality of parental involvement. If we consider that such differences are purposeful, we may view them as evidence of organizational agency. The purposive actions schools take as they strive to meet their goals thus reflect organizational intentionality, or agency. Of course, organizational agency results from the negative actions of individuals.

In addition to human agency, organizational functioning also depends on the knowledge, vicarious learning, self-reflection, and self-regulation of

individual members. For example, a school that responds to declining achievement scores by implementing a curricular reform that was effective in a neighboring district is engaged in a self-regulatory process that is informed by the vicarious learning of its members. Such examples make clear that the assumptions of social cognitive theory about the importance of vicarious learning and self-regulation also apply to organizations, although we must recognize that it is through individuals that organizations act. In addition, the sources of efficacy information identified for individuals in social cognitive theory can be seen as sources of collective efficacy information.

Sources of Collective Efficacy Information

Bandura (1986, 1997) postulated four sources of self-efficacy information: mastery experience, vicarious experience, social persuasion, and emotional arousal. Just as these sources are critical for individuals, they are also fundamental in the development of collective teacher efficacy.

Mastery experience. Mastery experiences are important for organizations. As a group, teachers experience successes and failures. Successes build a robust belief in the faculty's sense of collective efficacy and failures undermine it. If success, however, is frequent and too easy, failure is likely to produce discouragement. A resilient sense of collective efficacy probably requires experience in overcoming difficulties through persistent effort. Indeed, organizations learn by experience whether they are likely to succeed in attaining their goals (Huber, 1996; Levitt & March, 1996).

Vicarious experience. Teachers do not rely on direct experience as the only source of information about their collective efficacy. They listen to stories about achievements of their colleagues as well as success stories of other schools. Similarly, research on effective schools enumerates the characteristics of exemplary schools. Just as vicarious experience and modeling serve as effective ways to develop personal teacher efficacy, so too do they promote collective teacher efficacy. Organizations learn by observing other organizations (Huber, 1996).

Social persuasion. Social persuasion is another means of strengthening a faculty's conviction that they have the capabilities to achieve their goals. Talks, workshops, professional development opportunities, and feedback about achievement can influence teachers. The more cohesive the faculty, the more likely the group as a whole can be persuaded by sound argument. Verbal persuasion alone is not likely to be a powerful change agent. Coupled with models of success and positive direct experience, it can influence the collective efficacy of a faculty. Persuasion can also encourage a faculty to give the extra effort that leads to success; thus, persuasion can support persistence and persistence can lead to the solution of problems.

Affective states. Organizations have affective states. Just as individuals react to stress, so do organizations. Efficacious organizations can tolerate pressure and crises and continue to function without severe negative consequences; in fact, they learn how to adapt and cope with disruptive forces.

When confronted by such forces, less efficacious organizations react in dysfunctional ways, which reinforce their basic dispositions of failure. They misinterpret stimuli, sometimes overreacting, underreacting, or not reacting at all. The affective state of an organization has much to do with how challenges are interpreted by the organizations.

Elements of Collective Efficacy

Although all four sources of information are pivotal in the creation of collective teacher efficacy, the cognitive processing and interpretation of this information are critical. Consistent with the Tschannen-Moran et al. (1998) model of teacher efficacy described earlier, we postulate two key elements in the development of collective teaching efficacy: analysis of the teaching task and assessment of teaching competence. Further, we postulate that perceptions of group capability to successfully educate students result when teachers consider the level of difficulty of the teaching task (in relation) to their perceptions of group competence. Although we may discuss analysis of the teaching task and perceptions of group competence separately, perceptions of collective efficacy are formed only after teachers weigh these elements in relation to one another.

Analysis of the teaching task. Teachers assess what will be required as they engage in teaching; we call this process the analysis of the teaching task. This analysis occurs at the individual and school levels. At the school level, the analysis produces inferences about the challenges of teaching in that school, that is, what it would take for teachers in the school to be successful. Factors that characterize the task include the abilities and motivations of students, the availability of instructional materials, the presence of community resources and constraints, and the appropriateness of the school's physical facilities. To summarize, teachers analyze what constitutes successful teaching in their school, what barriers or limitations must be overcome, and what resources are available to achieve success.

Assessment of teaching competence. Teachers analyze the teaching task in conjunction with their assessment of the teaching competency of the faculty; in fact, teachers make explicit judgments of the teaching competence of their colleagues in light of an analysis of the teaching task in their specific school. At the school level, the analysis of teaching competence produces inferences about the faculty's teaching skills, methods, training, and expertise. Judgments of teaching competence might also include positive faculty beliefs in the ability of all children in their school to succeed. Because the analyses of task and competence occur simultaneously, it is difficult to separate these two domains of collective teacher efficacy. They interact with each other as collective teacher efficacy emerges. In sum, the major influences on collective teacher efficacy are assumed to be the attributional analysis and interpretation of the four sources of information—mastery experience, vicarious experience, social persuasion, and affective state (Gist & Mitchell,

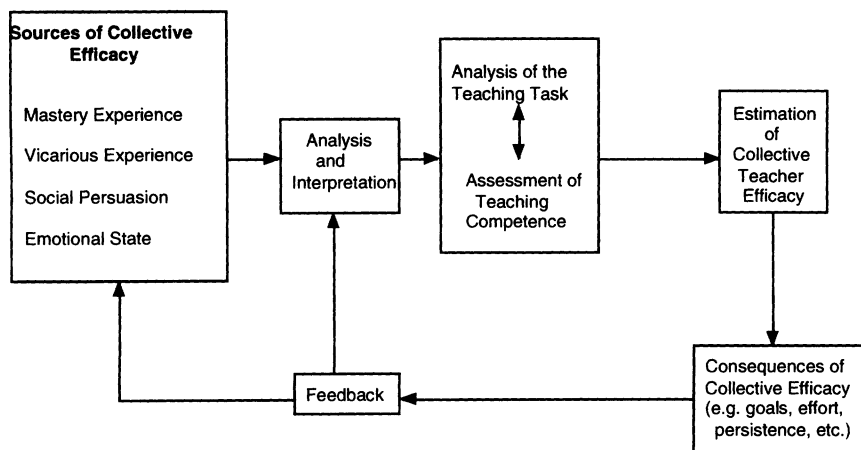


Figure 1. A simplified model of collective teacher efficacy

1992). In these processes, the organization focuses its attention on two related domains: the teaching task and teaching competence. Both domains are assessed in terms of whether the organization has the capacities to succeed in teaching students. The interactions of these assessments lead to the shaping of collective teacher efficacy in a school.

We theorize that the consequences of high collective teacher efficacy will be the acceptance of challenging goals, strong organizational effort, and a persistence that leads to better performance. Of course, the opposite is also true. Lower collective efficacy leads to less effort, the propensity to give up, and a lower level of performance. The development and components of collective teacher efficacy are summarized in Figure 1. As shown in Figure 1, the proficiency of performance provides feedback to the organization, which provides new information that will further shape the collective teacher efficacy of the school. Beliefs about both the task of teaching and the teaching competence, however, are likely to remain unchanged unless compelling evidence intrudes and causes them to be reevaluated (Bandura, 1997). Once established, the collective efficacy of a school is a relatively stable property that requires substantial effort to change.

We sought to develop a measure of collective teacher efficacy guided by the theoretical model developed above. Collective teacher efficacy is a construct measuring teachers' beliefs about the collective (not individual) capability of a faculty to influence student achievement; it refers to the perceptions of teachers that the efforts of the faculty of a school will have a positive effect on student achievement. One must consider, however, whether an assessment of collective teacher efficacy should ask teachers about perceptions of themselves, or ask about perceptions of the faculty as a whole. The difference between these two alternatives is represented in the following sample items about teacher competence:

- Individual orientation: “I am able to get through to the most difficult students.”
- Group orientation: “Teachers in this school can get through to the most difficult students.”

Our decision to choose a group orientation for the items in our collective efficacy scale was influenced by the perspective that group orientated items reflect the collective experience of group members better than individually-oriented items. Indeed, Porter (1992) noted that when organizational-level aggregates are constructed from individual-level responses, the individual responses are not independent, but rather they are subject to the influences of group membership. Porter therefore suggested that if questions reflect a group orientation (as in example 2 above), group level influences are more accurately reflected in the group mean. This strategy is also consistent with Sirotnik (1980) who observed that “what is being operationalized *at the item level*. . .” (p. 259) reflects what one is measuring. Because we intended our scale to operationalize a group-level construct—collective teacher efficacy—we chose a group orientation for the items.

Researchers examining teacher efficacy scales have cautioned that the wording of items may influence respondents. In particular, teachers may express different efficacy beliefs depending on whether the outcomes described are positive or negative (Guskey, 1982, 1987; Woolfolk & Hoy, 1990). We made certain to include both positively (+) and negatively worded (–) items in our scale. Finally, following the model of collective teacher efficacy developed in this article, items were worded so that teachers would consider both group competence (GC) and task analysis (TA) in their efficacy assessments. This approach led to the identification of four types of items to assess collective efficacy beliefs: group competence/positive (GC+), group competence/negative (GC–), task analysis/positive (TA+), and task analysis/negative (TA–).

One of the most commonly used and well-researched instruments for assessing teacher efficacy is the Likert-type scale developed by Gibson and Dembo (1984). Although the original scale contains 30 items, researchers often use a 16-item version that contains the most reliable and factorially pure items. We used the 16-item version of the Gibson and Dembo instrument as a beginning point in developing our scale, adapting the items to adhere to the four categories described above (GC+, GC–, TA+, TA–). One obvious difference between the Gibson and Dembo teacher efficacy instrument and the collective teacher efficacy instrument developed here is that Gibson and Dembo’s measure used individually oriented items whereas our items are group oriented. For example, a Gibson and Dembo item such as “I can reach a difficult student,” was restarted to assess collective efficacy as follows, “Teachers in this school can reach a difficult student.” Using our four categories to analyze the 16-item Gibson and Dembo instrument, we found that only two categories were represented—positively worded items about competence and negatively worded items about the task. In order to repre-

sent all four types in our model, we had to create negatively worded items to address competence and positively worded items to address task. The sample items below are examples of the four types of collective efficacy:

- Teachers in this school are well prepared to teach the subjects they are assigned to teach (GC+).
- Teachers here don't have the skills needed to produce meaningful student learning (GC-).
- The opportunities in this community help ensure that these students will learn (TA+).
- The lack of instructional materials and supplies in this school makes teaching very difficult (TA-).

The response format of our scale is the same 6-point Likert (*strongly agree* to *strongly disagree*) format used by Gibson and Dembo.

Preliminary Review

To ensure that the items selected for inclusion in the survey adequately represented the content of collective teacher efficacy, a panel of three experts from The Ohio State University (a professor of educational psychology, a professor of educational administration, and a teacher efficacy researcher) reviewed the questionnaire. Each member received copies of the collective teacher efficacy instrument and was asked to judge whether the items adequately represented the four response categories of collective teacher efficacy outlined above (GC+, GC-, TA+, TA-). The experts noted that in addition to influences outside the school (e.g., home support and student readiness), the teaching task also included influences within the school (e.g., the availability of a wide range of materials and supplies used in teaching). In response, items reflecting the availability of teaching materials and supplies were added to the collective teacher efficacy instrument in an attempt to reflect the teaching task faced by elementary school teachers. One panel member also made several helpful comments on the wording of the items. Changes in response to the panel concerns were made.

Field Test

The revised instrument was submitted to a field test. Six teachers were asked to give feedback regarding the clarity of instructions, length of the instrument, appropriateness of the questions, and any other responses they had to the instrument. The feedback of these teachers was intended to provide another opportunity to revise the survey instrument before conducting a pilot study. The teachers who participated in the field test noted no difficulties or concerns with the instrument.

Pilot Study

Sample. A sample of 70 teachers, one from each of 70 schools in five states, was selected to test the psychometric properties of the Collective

Teacher Efficacy Scale using the method of known groups (Rokeach, 1960). One half of the selected schools had reputations of relatively high conflict and the other half had relatively low conflict among the faculty. School reputations for conflict were ascertained from educators, administrators and professors of education familiar with the school. Because our sample was a convenience sample consisting of schools recommended as high or low in conflict, we did not confront the problem of persons' inability to classify the schools. Sampled schools were those identified as falling into one category or the other; by design, this approach facilitated our application of the method of known groups. The 46 teachers in 46 schools who returned usable responses represented 66% of the schools sampled. Of these 46 schools, 24 were low-conflict and 22 were high-conflict schools.

Instruments. In addition to the collective teacher efficacy items, teachers were asked to respond to a sense of powerlessness scale (Zielinski & Hoy, 1983), an individual teacher efficacy scale (Bandura, 2000), and a measure of teacher trust in colleagues (Hoy & Kupersmith, 1985; Hoy & Sabo, 1998). These additional measures were included to provide a validity check on the efficacy measure. We predicted that collective teacher efficacy would be positively related to teacher efficacy and trust in colleagues and that it would be negatively related to a sense of powerlessness and the degree of conflict.

Results. Teacher responses were submitted to a principal axis factor analysis with a varimax rotation. Two factors emerged from the collective efficacy items (eigenvalues of 7.53 and 1.96) that explained a total of 63.2% of the variance in the collective teacher efficacy items. Close inspection of the factor loadings revealed that, with one exception, the items loading on Factors 1 and 2 reflected the group competence and task analysis dimensions of collective efficacy, respectively.

The only item that did not load higher on the expected factor was written to assess teachers' perceptions of group competence, "Teachers here don't have the skills needed to reach all of the students." The skills needed to reach all of the students certainly depend on the characteristics of the students as well as other relevant dimensions of the teaching task. This item loaded slightly higher on the task analysis factor. Although the item is the only one that did not load higher on the factor expected, there were five other items loading .40 or higher on both factors. These dual loadings indicated that teachers had difficulty separating their perceptions of the collective capabilities of a faculty from their perceptions of the teaching task. This finding was consistent with our theoretical model that indicates collective efficacy, rather than being comprised of two separate and unique dimensions, results from cognitive processing that integrates teachers' perceptions of group competence and their assessment of the task; in other words, collective efficacy reflects perceptions of group competence judged relative to the task at hand. We further examined the independence of the factors by correlating them. The correlation coefficient indicated a strong relation ($r = .71, p < .001$) between the factors. Given the theoretical connection between

perceptions of competence and the task in defining collective efficacy as well as the dual loading of many of the items in the initial factor analysis and the high correlation between the factors, we performed a second factor analysis, calling for a one-factor solution. The single factor explained 50.5% of the variance in the collective efficacy items. The loadings for the items ranged from .47 to .87 with all but four items loading .71 or above.

These results provided evidence that collective teacher efficacy in elementary schools is a single construct uniting the concepts of group competence and task analysis. Accordingly, a single collective teacher efficacy score was constructed for each of the pilot study schools. The scale was calculated as the mean score of all items in the collective teacher efficacy survey.

To check for criterion-related validity of the collective teacher efficacy scale, we examined the relationships between collective teacher efficacy and conflict, sense of powerlessness, trust in colleagues, and individual efficacy. As predicted, conflict was negatively related to collective efficacy. The mean collective teacher efficacy score for low conflict schools (4.27) was significantly higher ($t = 5.08, p < .001$) than the mean score for high conflict schools (3.17).

Teacher powerlessness (Zielinski & Hoy, 1983) served as a criterion expected to be negatively related to collective teacher efficacy. In a school where teachers feel powerless, it is likely that organizational agency, a key mechanism of collective teacher efficacy, would be weakened. As predicted, the correlation between collective teacher efficacy and teacher powerlessness was significant and negative ($r = -.51, p < .001$).

Trust in colleagues (Hoy & Kupersmith, 1985; Hoy & Sabo, 1998) served as a criterion expected to be positively related to collective teacher efficacy. Schools with highly trusting teachers offer enhanced levels of collegiality and, therefore, more opportunities for vicarious learning than are found in schools where teachers perceive less trust. With increased exposure to efficacy-building, vicarious learning likely leads to higher collective efficacy. As expected, the correlation between collective efficacy and trust among colleagues was positive and significant ($r = .67, p < .001$).

Finally, the validity of the collective teacher efficacy scale was also tested using a 10-item measure of teacher efficacy developed by Bandura (2000). As expected, collective teacher efficacy and aggregated individual teacher efficacy were moderately and positively related ($r = .41, p < .001$). The results of the correlated analyses along with reliability information are summarized in Table 1.

The results of the pilot study supported the validity and reliability of our collective efficacy measure, but several minor weaknesses were revealed. One was item redundancy. In particular, two items were similar in the way that they united perceptions of task and competence ("Teachers here need more training to know how to deal with these students" and "Teachers here don't have the skills needed to reach all of the students"). In the interest of parsimony, we decided to delete the latter item based on its lower factor

Table 1
Reliabilities and Correlations for Pilot Study Variables

Variable	CTE	TP	TT	TE
Collective teacher efficacy CTE	.92 ^a			
Teacher powerlessness (TP)	-.51**	.83 ^a		
Trust in teachers (TT)	.67**	-.33*	.95 ^a	
Teacher efficacy (TE)	.41**	-.55**	.30*	.87 ^a

^aScale reliabilities along diagonal.
*Correlation significant at the .05 level.
**Correlation significant at the .01 level.

loading. Of the 14 remaining items, 4 related to task analysis. Of these four task analysis items, two referred to materials and supplies. Again, we decided to delete the item with the lower loading.

The pilot analysis also led to the development of new items about perceptions of group competence and task analysis. After deleting the items above, we reexamined our scale to determine whether additional items could be generated that would strengthen our measure of collective efficacy. Three additional group competence items reflecting teachers' perceptions of the subject matter knowledge (CTE17), pedagogical skills (CTE18), and classroom management skills (CTE21) of their colleagues were written in consultation with the panel of experts. To provide a more comprehensive assessment of the difficulties and resources inherent to the task of teaching in a given school, the task analysis dimension was enhanced with additional items reflecting the influence of student safety concerns (CTE19), drug and alcohol abuse (CTE20), school facilities (CTE15), student motivation (CTE14), and community support (CTE16). All of the items in the final collective teacher efficacy instrument are summarized in Table 2.

A Further Test of the Collective Efficacy Scale

Having developed a measure of collective teacher efficacy in our field and pilot studies, we were ready to test the scale in a more comprehensive sample. In particular, we were interested in checking its psychometric properties and using the scale to test some predictions about collective teacher efficacy and student achievement in urban elementary schools.

Sample

The population for this study comprised the elementary schools within one large urban midwestern school district. An urban district was selected to hold constant differences in teacher efficacy that might occur between urban and nonurban districts. Additionally, because this study focused on schools in just one district, there is no possibility for uncontrolled between-district

Table 2
Revised Collective Teacher Efficacy Instrument

Study no.	Pilot no.	Item	GC+	GC-	TA+	TA-
CTE1	1	Teachers in this school have what it takes to get the children to learn.	X			
CTE2	2	Teachers in this school are able to get through to difficult students.	X			
CTE3	3	If a child doesn't learn something the first time, teachers will try another way.	X			
CTE4	4	Teachers here are confident they will be able to motivate their students.	X			
CTE5	5	Teachers in this school really believe every child can learn.	X			
CTE6	6	If a child doesn't want to learn teachers here give up.		X		
CTE7	7	Teachers here need more training to know how to deal with these students.		X		
CTE8	8	Teachers in this school think there are some students that no one can reach.		X		
CTE9	9	Teachers here don't have the skills needed to produce meaningful student learning.		X		
CTE10	11	Teachers here fail to reach some students because of poor teaching methods.		X		
CTE11	12	These students come to school ready to learn.			X	
CTE12	13	Homelife provides so many advantages they are bound to learn.			X	
CTE13	14	The lack of instructional materials and supplies makes teaching very difficult.				X
CTE14	New	Students here just aren't motivated to learn.				X
CTE15	New	The quality of school facilities here really facilitates the teaching and learning process.			X	
CTE16	New	The opportunities in this community help ensure that these students will learn.			X	
CTE17	New	Teachers here are well prepared to teach the subjects they are assigned to teach.	X			
CTE18	New	Teachers in this school are skilled in various methods of teaching.	X			
CTE19	New	Learning is more difficult at this school because students are worried about their safety.				X
CTE20	New	Drug and alcohol abuse in the community make learning difficult for students here.				X
CTE21	New	Teachers in this school do not have the skills to deal with student disciplinary problems.		X		

Note. GC = group competence; TA = task analysis; CTE = collective teacher efficacy.

effects. Further, limiting this study to elementary schools controls for the organizational structure (i.e., elementary, middle, secondary) of the schools, thus allowing for a constant approach to the measurement of collective efficacy. The principal from each of 50 randomly selected schools was solicited via phone by a researcher to schedule a time for the administration of surveys to school faculty (no schools from the pilot study were included in this group). One principal declined to participate. Of the 49 participating schools, 2 provided fewer than five faculty respondents. Our decision rule for including a school in the data analysis was having at least five respondents (Halpin, 1959). These two schools were dropped from the sample, leaving 47 schools or 94% of the 50 schools randomly selected for inclusion. A total of 452 teachers completed surveys and over 99% of the forms returned were usable.

Data Collection

Data were obtained from both teachers and students in the 47 elementary schools. Student achievement and demographic data for all schools in the final sample were obtained from the central administrative office of the district. Teacher surveys, on the other hand, were researcher administered. To the greatest extent possible, the researcher controlled the location, time, and conditions under which these surveys were administered to teachers. Surveys were administered to faculty groups in the afternoon, during regularly scheduled faculty meetings. During these meetings, other data beyond the scope of this study were also collected from teachers. For this reason, one half of the teachers in the room received a survey containing questions assessing collective efficacy and other social processes in school—personal teaching efficacy (Hoy & Woolfolk, 1993) and faculty trust in colleagues (Hoy & Kupersmith, 1985). The other one half received another survey with different questions, including a measure of institutional integrity (Hoy & Sabo, 1998). Distribution occurred so that every other teacher received a collective efficacy survey; teachers sitting next to one another had different surveys. Elementary school faculties in the selected district ranged in size from approximately 10 to 40. Thus, for any given school, faculty perceptions are represented by the responses of one half of the faculty (approximately 5–20 teachers, depending on school size).

Because this study was guided by Bandura's work and because there is evidence to support the conjecture that efficacy perceptions are associated with student achievement in mathematics and reading, both subjects were selected as the dependent variables for this study. The achievement variables were measured by the 7th ed. of the Metropolitan Achievement Test. Student test scores, gender, race/ethnicity, free and reduced-price lunch status (a proxy for socioeconomic status [SES]), and school size were provided by the school district. The Metropolitan tests are given in the second, third, and fifth grades; there were 2,520 students in Grade 2, 2,438 in Grade 3, and 2,058 in Grade 5, for a total of 7,016 students in the final sample.

Collective Teacher Efficacy Scale

Teacher responses to the 21-item collective teacher efficacy instrument were aggregated to the school level and submitted to a factor analysis. The aggregation procedure produced a mean school score for each of the 21 items. Given our model for collective teacher efficacy and the results from the pilot, we expected one strong factor to be extracted. Inspection of the loadings in Table 3 reveals that, in fact, all items loaded strongly on a single factor and explained 57.89% of the variance. As a test of factor independence, we also constructed a two factor solution (Appendix A). The strength of the correlation between these factors ($r = .75, p < .001$) provided further evidence that collective teacher efficacy is the common unobserved factor operationalized by our revised collective efficacy scale.

Validity and reliability. The collective teacher efficacy data were gathered along with data measuring other social processes in schools. These additional data provided the opportunity to perform further tests of criterion-related validity for the collective teacher efficacy scale. The criterion variables examined were personal teaching efficacy (Hoy & Woolfolk, 1993), faculty trust in colleagues (Hoy & Kupersmith, 1985), and environmental press (Hoy & Sabo, 1998). Personal teaching efficacy is a measure of a teachers' self-perceptions of capability to educate students. It was predicted that when aggregated to the school level, teachers' perceptions of personal efficacy would be moderately and positively related to collective teacher efficacy; a high correlation was not expected because personal and collective teacher efficacy have different referents (self vs. group). Moreover, the collective teacher efficacy measure directly assesses perceptions of both perceived competence and task whereas the personal teacher efficacy measure includes only items about competence. As predicted, there was a moderate and positive ($r = .54, p < .01$) correlation between personal teacher efficacy aggregated at the school level and collective teacher efficacy.

A positive relationship between faculty trust in colleagues and collective teacher efficacy was predicted. Similar to the pilot results, trust in colleagues was positively and significantly related to collective teacher efficacy ($r = .62, p < .01$).

Finally, we predicted no relationship between collective teacher efficacy and environmental press or the extent to which teachers experience "unreasonable community demands" (Hoy & Sabo, 1998). There is no a priori reason to expect that teachers' assessments of group capabilities would be associated with their perceptions of external demands. In other words, a demanding task and external pressures do not necessarily make people feel more or less capable. It is how they handle the pressure that determines capability. As predicted, the observed relationship between collective teacher efficacy and environmental press was not statistically significant ($r = .05, n.s.$). See Table 4 for a summary of the correlational results.

Table 3
Factor Loadings for a One-Factor Solution

Item no.	Items	Factor loadings
CTE4	Teachers here are confident they will be able to motivate their students.	.93
CTE1	Teachers in this school have what it takes to get the children to learn.	.84
CTE5	Teachers in this school really believe every child can learn.	.84
CTE2	Teachers in this school are able to get through to difficult students.	.83
CTE11	These students come to school ready to learn.	.82
CTE19	Learning is more difficult at this school because students are worried about their safety.	.80
CTE9	Teachers here don't have the skills needed to produce meaningful student learning.	.79
CTE14	Students here just aren't motivated to learn.	.79
CTE21	Teachers in this school do not have the skills to deal with student disciplinary problems.	.77
CTE6	If a child doesn't want to learn teachers here give up.	.77
CTE10	Teachers here fail to reach some students because of poor teaching methods.	.76
CTE7	Teachers here need more training to know how to deal with these students.	.74
CTE16	The opportunities in this community help ensure that these students will learn.	.73
CTE17	Teachers here are well prepared to teach the subjects they are assigned to teach.	.72
CTE20	Drug and alcohol abuse in the community make learning difficult for students here.	.72
CTE3	If a child doesn't learn something the first time teachers will try another way.	.72
CTE8	Teachers in this school think there are some students that no one can reach.	.69
CTE12	Homelife provides so many advantages they are bound to learn.	.65
CTE18	Teachers in this school are skilled in various methods of teaching.	.64
CTE13	The lack of instructional materials and supplies makes teaching very difficult.	.62
CTE15	The quality of school facilities here really facilitates the teaching and learning process.	.61

Note. CTE = collective teacher efficacy.

According to Kerlinger (1986), the construct validity of an operational measure may be established with correlational evidence that shows a given construct is positively related, negatively related, and not related to other constructs as expected. Taken together, the results from both the pilot and

Table 4
Reliabilities and Correlations for Collective Teacher Efficacy Scale

Variable	CTE	PTE	TC	II
Collective teacher efficacy (CTE)	.96 ^a			
Personal teaching efficacy (PTE)	.54*	.79 ^a		
Trust in colleagues (TC)	.62*	.23	.92 ^a	
Institutional Integrity (II)	.05	-.01	-.05	.66 ^a

^aScale reliabilities along diagonal.
*Correlation significant at the .01 level.

full study show that, as predicted, our measure of collective teacher efficacy was positively related to (a) aggregated teacher efficacy as assessed by Bandura’s (2000) measure, (b) aggregated personal teacher efficacy assessed using Hoy and Woolfolk’s (1993) adaptation of a set of Gibson and Dembo (1984) items, (c) and faculty trust in colleagues. In addition, collective efficacy was negatively related to teacher powerlessness and unrelated to environmental press. These results provide evidence that the collective teacher efficacy scale employed in this study is valid. In addition, the measure has high internal reliability (alpha = .96).

Collective Teacher Efficacy and Student Achievement

Collective teacher efficacy is a way of conceptualizing the normative environment of a school and its influence on both personal and organizational behavior. That is, teachers’ beliefs about the faculty’s capability to successfully educate students constitute a norm that influences the actions and achievements of schools. Given that collective teacher efficacy shapes the normative environment of a school, understanding how collective teacher efficacy influences student achievement requires that we consider the influence of social norms on the behavior of group members.

Rationale and Hypothesis

Because social cognitive theory specifies that teachers’ perceptions of self and group capability influence their actions, it follows that these actions will be judged by the group relative to group norms such as those set by collective efficacy beliefs. According to Coleman (1985, 1987), norms develop to permit group members some control over the actions of others when those actions have consequences for the group. When a teacher’s actions are incongruent with the shared beliefs of the group, the teacher’s actions will be sanctioned by group members; in fact, Coleman argued

that the severity of the social sanction delivered to those who break norms will be equal in magnitude to the effect of norm-breaking on the collective. If most teachers in a school are highly efficacious, the normative environment will press teachers to persist in their educational efforts. Moreover, the press to perform will be accompanied by social sanctions for those who do not.

Because collective teacher efficacy beliefs shape the normative environment of a school, they have a strong influence over teacher behavior and, consequently, student achievement. Based on self-efficacy theory, we suggest that when collective efficacy is high, teachers in a school believe they can reach their students and that they can overcome negative external influences. Given these beliefs, teachers are more persistent in their efforts; they plan more; they accept responsibility for student achievement; and temporary setbacks or failures do not discourage them. Strong collective efficacy perceptions not only enhance individual teacher performance, they also influence the pattern of shared beliefs held by organizational members. Given the influence of group norms, a teacher with average personal efficacy beliefs may tend to exert even more effort upon joining a faculty with high levels of collective teacher efficacy. Such behavioral changes reflect the normative effect of a school's collective efficacy on its individual members.

Several school-level studies indicate that aggregated teacher efficacy is associated with increased rates of parental involvement (Hoover-Dempsey, Bassler, & Brissie, 1987), students' prior ability, school orderliness, teacher innovation, teacher knowledge of other teachers' courses (Newmann et al., 1989), and suspensions and dropout rates (Esselman & Moore, 1992). Although these studies suggest that the organizational characteristic measured by aggregated individual teacher efficacy has desirable effects, these studies did not examine collective teacher efficacy. Indeed, if we search for studies of collective teacher efficacy that focus on student achievement, we find only one (Bandura, 1993). In this groundbreaking study of collective teacher efficacy and student achievement, Bandura reached two important conclusions: (a) student achievement (aggregated to the school level) is significantly and positively related to collective efficacy and (b) collective efficacy has a greater effect on student achievement than does student SES (aggregated to the school level).

Bandura's conclusions are powerful ones that offer great hope to schools struggling to increase student achievement and overcome the association between SES and achievement. Our study is influenced by Bandura's (1993) research; however, it is not a replication. Although our study does consider the variables investigated by Bandura, there is an important methodological difference. Unlike Bandura and the authors of prior studies of aggregated teacher efficacy (Esselman & Moore, 1992; Newmann et al., 1989), we did not aggregate student achievement or SES to the school level. This analytic decision preserves the considerable variance in student characteristics that occurs within schools and avoids the bias that results when

student characteristics are aggregated to the school level. Instead of aggregating student characteristics to the school level, this study of collective teacher efficacy was conducted using multilevel modeling. This allowed us to analyze only the portion of variance in student characteristics that occurs between schools. Hierarchical linear modeling (HLM) was employed to avoid the aggregation bias, misestimated standard errors, and heterogeneity of regression that may compromise the results of studies in which student characteristics are aggregated to the school level (Bryk & Raudenbush, 1992).

Collective teacher efficacy is conceived as an emergent characteristic of schools, one that gains its meaning from collective perceptions and is, therefore, not reducible to the individual measures from which group-level aggregates are constructed. Yet, collective teacher efficacy, along with many organizational features such as school size and climate, is experienced individually by each organizational member. From a methodological perspective, this reality is a multilevel phenomenon. For example, whereas an individual teacher may be highly inefficacious, that teacher might perform differently depending on whether the majority of teacher colleagues in a school share strong perceptions of collective efficacy. In other words, the effect of an individual teacher's efficaciousness may be either attenuated or enhanced depending on the level of collective efficacy in a school. Collective teacher efficacy may positively affect numerous teacher behaviors that tend to increase student achievement. Accordingly, we hypothesize that collective teacher efficacy is positively associated with differences between schools in student-level achievement.

Results

The dependent variables for this study were student achievement in mathematics and reading. The decision to investigate the relationship between these dependent variables and collective teacher efficacy was made in light of the relationships observed between teacher efficacy and student achievement in prior studies and the theoretical rationale described above. The dependent variables in previous studies of teacher efficacy included reasoning in language as measured by the New Jersey Test of Reasoning Skills (Anderson et al., 1988), reading achievement (Armor et al., 1976), and mathematics, language, and reading as measured by the Metropolitan Achievement Test (Ashton & Webb, 1986). Additionally, in his study of collective efficacy, Bandura (1993) observed a relationship between collective efficacy and mathematics and reading achievement. Because our study is guided by Bandura's work and because there is additional evidence to support the conjecture that efficacy perceptions are associated with student achievement in mathematics and reading, these were selected as the dependent variables for the present study. Furthermore, consistent with the reasoning of Lee and Smith (1997), we chose math and reading achievement because

Table 5
Descriptive Statistics for Student-Level Variables

Variable	<i>M</i>	<i>SD</i>	Minimum	Maximum
Mathematics	44.90	20.42	6.70	99.00
Reading	46.23	19.86	6.70	99.00
SES	.66	.47	0.00	1.00
AFAM	.57	.50	0.00	1.00
FEMALE	.50	.50	0.00	1.00

Note. SES = socioeconomic status; AFAM = African American.

these subjects are important to students' future and are different from one another.

Within each school, we modeled the variance in student mathematics and reading achievement associated with student-level demographic variables representing SES, African American status, and gender. SES was operationalized as a dichotomous variable reflecting a student's free or reduced-price lunch status. Students receiving a free or reduced-price lunch were coded 1 whereas all others were coded 0 for the variable SES. Similarly, African American students were coded 1 for AFAM and female students were coded 1 for FEMALE. African American status, SES, and gender were used as control variables as we examined the relation between collective efficacy and student achievement. Descriptive statistics for the student-level variables are reported in Table 5 and correlations among these variables are reported in Table 6.

Our multilevel analyses began with an estimation of the proportion of variance in the dependent variables that occurs between schools. These estimates provided a basis for later assessing the proportion of variance explained by collective teacher efficacy in the full multilevel model. As expected, the proportion of variance between schools in both students' mathematics (19%) and reading (15%) achievement was statis-

Table 6
Correlations Among Student-Level Variables

Variable	Mathematics	Reading	SES	AFAM	FEMALE
Mathematics	1.0				
Reading	.66*	1.0			
SES	-.27*	-.29*	1.0		
AFAM	-.23*	-.22*	.26*	1.0	
FEMALE	.00	.10*	.01	.01	1.0

Note. SES = socioeconomic status; AFAM = African American.

*Significant at the .01 level.

Table 7
Collective Efficacy as a Predictor of Variation in Intercepts for
Mathematics Achievement

Variable	Coefficient	SE	T ratio	p value
Intercept	52.78	1.04	50.67	<.001
CE	8.62	1.96	4.40	<.001
SES slope	-5.49	.52	-10.56	<.001
AFAM slope	-7.00	.53	-13.32	<.001
FEMALE slope	-.03	.44	-.08	n.s.

Note. SES = socioeconomic status; AFAM = African American.

tically significant so we proceeded with multilevel tests of our research hypothesis.

Our multilevel hypothesis frames between-school variance in the Level 1 intercepts (B_{j0} s) as the school-level dependent variable. At Level 1, the intercepts for each of the 47 sampled schools are the operational measure of between-school differences in student achievement. At the school level, these intercepts are the dependent variable and collective teacher efficacy is the independent variable. The corresponding structural equations employed for both mathematics and reading achievement are given below.¹

Level 1: $Y_{ij} = B_{j0} + B_{jSES}X_{ijSES} + B_{jAFAM}X_{ijAFAM} + B_{jFEMALE}X_{ijFEMALE} + r_{ij}$

Level 2: $B_{j0} = \gamma_{00} + \gamma_{0CE}W_{jCE} + \mu_{0j}$

The results of the hypothesis tests for mathematics and reading achievement are shown in Tables 7 and 8.

As predicted, collective teacher efficacy is a significant predictor of student achievement in both mathematics and reading achievement. Indeed, the effect of collective teacher efficacy is greater in magnitude than that of any one of the demographic controls for both achievement variables. This is consistent with Bandura's (1993) assertion that collective teacher efficacy has a greater effect on student achievement than does student SES. That is, the negative association between SES and achievement is more than offset by the positive association between collective teacher efficacy and student achievement.

The proportion of between-school variance in student achievement explained by collective teacher efficacy was calculated as the reduction in the unconditional between-school variance reported earlier. In our full model, collective teacher efficacy explained 53.27% and 69.64% of the between-school variance in mathematics and reading, respectively. This sug-

Table 8
**Collective Efficacy as a Predictor of Variation in Intercepts for
 Reading Achievement**

Variable	Coefficient	SE	T ratio	p value
Intercept	51.99	.81	64.11	<.001
CE	8.49	1.42	9.58	<.001
SES slope	-6.62	.51	-12.98	<.001
AFAM slope	-5.74	.51	-11.20	<.001
FEMALE slope	4.12	.43	9.59	<.001

Note. SES = socioeconomic status; AFAM = African American.

gests that our full model with collective teacher efficacy explains roughly between one half and two-thirds of the variance between schools in student achievement. With the effects of collective teacher efficacy controlled, the remaining between-school variance is statistically nonzero. This suggests that, in addition to collective teacher efficacy, other school characteristics are systematically associated with between-school differences in student achievement.

Discussion

Our study of collective teacher efficacy led to several important findings. First, the theoretical elements of collective teacher efficacy—group competence and task analysis—are highly related in schools. The empirical results are consistent with our model of collective efficacy (Figure 1), which suggests that both analysis of the task and assessment of group competencies interact to orchestrate a conception of collective teacher efficacy in a school. Factor analyses of both pilot study and final study data support a single measure of collective teacher efficacy consisting of items that assess both analysis of the task and group competency.

Next, as predicted, collective teacher efficacy is positively associated with the differences in student achievement that occur between schools. The multilevel analysis demonstrates that a one unit increase in a school's collective teacher efficacy scale score is associated with a 8.62 point average gain in student mathematics achievement and a 8.49 point average gain in reading achievement. In other words, a one unit increase in collective teacher efficacy is associated with an increase of more than 40% of a standard deviation in student achievement. These results are consistent with Bandura's (1993) study, which indicates that collective efficacy was significantly and positively associated with school-level student achievement. Collective teacher efficacy perceptions are predictive of student achievement.

Our study offers initial evidence that collective efficacy perceptions are systematically related to student achievement. Although our hypothesis was supported by data drawn from a population of urban elementary schools, social cognitive theory does not predict that the impact of collective teacher efficacy would be limited to the urban schools we sampled. Accordingly, an open research question concerns whether there is also a positive relation between student performance and the collective efficacy of faculties in non-urban settings.

Finally, the theoretical conceptualization of teacher efficacy, grounded in social cognitive theory, can be extended to the organizational level to explain collective teacher efficacy. The empirical findings are consistent with the theoretical argument that collective teacher efficacy is a unified construct that promotes student achievement. Our theoretical analysis suggests that the assumptions of social cognitive theory (e.g., agency, vicarious learning, and self-regulation) can be applied at the organizational level to explain the influence of collective teacher efficacy on between-school differences in student achievement. In a school with a high level of collective teacher efficacy, teachers are more likely to act purposefully to enhance student learning. Such purposeful actions result from organizational agency that influences a school to intentionally pursue its goals. Schools are capable of self-regulation, which helps in the identification, selection, and monitoring of educational efforts that are likely to meet the unique needs of students.

To understand the influence of collective teacher efficacy in schools, it is necessary to understand that teachers' shared beliefs shape the normative environment of schools. These shared beliefs are an important aspect of the culture of a school. Collective teacher efficacy is a way of conceptualizing the normative environment of a school and its influence on both personal and organizational behavior. That is, teachers' beliefs about their faculty's capability to educate students constitute a norm that influences the actions and achievements of schools.

At the heart of the theoretical rationale explaining the relationship observed between collective teacher efficacy and student achievement is Bandura's (1997) theory of triadic reciprocal causation. Triadic reciprocal causation indicates that collective teacher efficacy beliefs influence the level of effort and persistence that individual teachers put forth in their daily work. Therefore, one way for school administrators to improve student achievement is by working to raise the collective efficacy beliefs of their faculties. Although mastery experiences are the most powerful efficacy changing forces, they may be the most difficult to deliver to a faculty with low collective efficacy. Thoughtfully designed staff development activities and action research projects, however, are ways school administrators might provide efficacy-building mastery experiences.

School administrators should also take opportunities to provide vicarious learning experiences and social persuasion to build the collective effi-

cacy of their faculty. Visits to model schools and videos of effective schools may be useful in this regard, especially when the models are similar in population and resources to the teachers' own school. Additionally, administrators should be attentive to both the competence and task dimensions of efficacy. It is not enough to hire and retain the brightest teachers—they must also believe they can successfully meet the challenges of the task at hand. When teachers believe they are members of a faculty that is both competent and able to overcome the detrimental effects of the environment, the students in their building have higher achievement scores than students in buildings with lower levels of collective teacher efficacy. Collective teacher efficacy is, however, not a panacea. There are other reasons that schools have different effects on student achievement. This study offers only initial evidence supporting a strong relationship between collective teacher efficacy and student achievement.

Conclusions

We have elaborated a theoretical model (Figure 1) that maps key elements of collective efficacy as well as its antecedents and consequences. The model suggests that collective teacher efficacy is an extension of individual teacher efficacy (Tschannen-Moran et al., 1998) to the organizational level. The attributional analysis and interpretation of mastery experiences, vicarious experiences, social persuasion, and affective states constitute processes through which the organization assesses the teaching task and faculty competence. Both domains are evaluated to determine whether the organization has the capacities to succeed in teaching students. Simply put, collective teacher efficacy is the perception of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students.

Using the model, we developed and tested an instrument to measure collective teacher efficacy. This efficacy scale proved to be reliable and valid in two independent samples, and it was useful in predicting student achievement in mathematics and reading. In both samples, assessments of the teaching task and teaching competence were strongly interrelated and formed a single, strong factor of collective efficacy.

This research constitutes a useful beginning for theorists, researchers, and school administrators alike who are interested in teacher efficacy, schools, and student achievement. The extant literature contains few investigations of collective teacher efficacy and fewer yet examine the relation between collective efficacy and student achievement. The results support Bandura's (1993) study by providing additional evidence that teacher beliefs about the capabilities of their faculty are systematically related to student achievement. Moreover, the findings confirm that the concepts and assumptions of social cognitive theory may be used to examine organizational behavior.

APPENDIX A
Collective Teacher Efficacy (CTE) Scale: A Two-Factor
Rotated Solution

Item no.	Item	Factor one	Factor two
CTE3	If a child doesn't learn something the first time teachers will try another way.	.83	.16
CTE18	Teachers in this school are skilled in various methods of teaching.	.83	.06
CTE17	Teachers here are well prepared to teach the subjects they are assigned to teach.	.83	.18
CTE5	Teachers in this school really believe every child can learn.	.82	.34
CTE6	If a child doesn't want to learn teachers here give up.	.78	.30
CTE10	Teachers here fail to reach some students because of poor teaching methods.	.74	.33
CTE9	Teachers here don't have the skills needed to produce meaningful student learning.	.70	.41
CTE1	Teachers in this school have what it takes to get the children to learn.	.68	.51
CTE2	Teachers in this school are able to get through to difficult students.	.67	.50
CTE4	Teachers here are confident they will be able to motivate their students.	.67	.64
CTE13	The lack of instructional materials and supplies makes teaching very difficult.	.66	.22
CTE21	Teachers in this school do not have the skills to deal with student disciplinary problems.	.63	.48
CTE8	Teachers in this school think there are some students that no one can reach.	.61	.39
CTE15	The quality of school facilities here really facilitates the teaching and learning process.	.58	.29
CTE12	Homelife provides so many advantages they are bound to learn.	.07	.93
CTE11	These students come to school ready to learn.	.33	.89
CTE20	Drug and alcohol abuse in the community make learning difficult for students here.	.22	.87
CTE16	The opportunities in this community help ensure that these students will learn.	.26	.82
CTE14	Students here just aren't motivated to learn.	.36	.80
CTE19	Learning is more difficult at this school because students are worried about their safety.	.47	.74
CTE7	Teachers here need more training to know how to deal with these students.	.46	.62

Note

¹Because our demographic control variables were dummy-coded, values of zero were meaningful and readily interpretable. Therefore, we did not group- or grand-mean

center these variables. At the school-level, because the collective efficacy did not have a meaningful zero value, we grand-mean centered this variable. Also, in the development of our within-school model, we tested whether the between-school variation in slopes for each control variable was statistically non-zero. For all of the slopes, there was no significant between-school variation. Therefore, we set the level-one student demographic control variables to vary non-randomly among schools (i.e., the residuals were set to zero) in all of our HLM analyses.

References

- Allinder, R. M. (1994). The relationship between efficacy and the instructional practices of special education teachers and consultants. *Teacher Education and Special Education, 17*, 86–95.
- Anderson, R., Greene, M., & Loewen, P. (1988). Relationships among teachers' and students' thinking skills, sense of efficacy, and student achievement. *Alberta Journal of Educational Research, 34* (2), 148–165.
- Armor, D., Conroy-Oseguera, P., Cox, M., King, N., McDonnell, L., Pascal, A., Pauly, E., & Zellman, G. (1976). *Analysis of the school preferred reading program in selected Los Angeles minority schools* (Report No. R-2007-LAUDS) [ERIC Document Reproduction Service No. 130 243]. Santa Monica, CA: Rand Corporation.
- Ashton, P. T., Olejnik, S., Crocker, L., & McAuliffe, M. (1982, April). *Measurement problems in the study of teachers' sense of efficacy*. Paper presented at the annual meeting of the American Educational Research Association, New York.
- Ashton, P. T., & Webb, R. B. (1986). *Making a difference: Teachers' sense of efficacy and student achievement*. New York: Longman.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191–215.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28* (2), 117–148.
- Bandura, A. (1995). *Guide for constructing self-efficacy scales*. Available from Frank Pajares, Emory University.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman.
- Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Newbury Park, CA: Sage.
- Cohen, M. D., & Sproull, L. S. (Eds.). (1996). *Organizational learning*. Thousand Oaks, CA: Sage.
- Coleman, J. S. (1985). Schools and the communities they serve. *Phi Delta Kappan, 66* (8), 527–532.
- Coleman, J. S. (1987). Norms as social capital. In G. Radnitzky & P. Bernholz (Eds.), *Economic imperialism: The economic approach applied outside the field of economics* (pp. 135–155). New York: Paragon House.
- Cook, S. D. N., & Yanon, D. (1996). Culture and organizational learning. In M. D. Cohen & L. S. Sproull (Eds.), *Organizational learning* (pp. 430–459). Thousand Oaks, CA: Sage.
- Esselman, M. E., & Moore, W. P. (1992, April). *In search of organizational variables which can be altered to promote an increased sense of teacher efficacy*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.
- Gibson, S., & Dembo, M. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology, 76* (4), 569–582.

- Gist, M. E., & Mitchell, T. R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review*, 17 (2), 183–211.
- Guskey, T. R. (1982). Differences in teachers' perceptions of personal control of positive and negative student learning outcomes. *Contemporary Educational Psychology*, 7, 70–80.
- Guskey, T. R. (1987). Context variables that affect measures of teacher efficacy. *Journal of Educational Research*, 81 (1), 41–47.
- Guskey, T. R., & Passaro, P. (1994). Teacher efficacy: A study of construct dimensions. *American Educational Research Journal*, 31, 627–643.
- Halpin, A. W. (1959). *The leader behavior of school superintendents*. Chicago: Midwest Administrative Center.
- Hoover-Dempsey, K., Bassler, O. C., & Brissie, J. S. (1987). Parent involvement: Contributions of teacher efficacy, school socioeconomic status, and other school characteristics. *American Educational Research Journal*, 24, 417–435.
- Hoy, W. K., & Kuppersmith, W. J. (1985). The meaning and measure of faculty trust. *Educational and Psychological Research*, 85 (5), 287–294.
- Hoy, W. K., & Woolfolk, A. E. (1993). Teachers' sense of efficacy and the organizational health of schools. *The Elementary School Journal*, 93 (4), 356–372.
- Hoy, W. K., & Miskel, C. G. (1996). *Educational administration: Theory, research, and practice*. New York: McGraw-Hill.
- Hoy, W. K., & Sabo, D. J. (1998). *Quality middle schools: Open and healthy*. Thousand Oaks, CA: Corwin Press, Inc.
- Huber, G. P. (1996). Organizational learning: The contributing processes and literatures. In M. D. Cohen & L. S. Sproull (Eds.), *Organizational learning* (pp. 124–162). Thousand Oaks, CA: Sage.
- Kerlinger, F. N. (1986). *Foundations of behavioural research*, 3rd Ed. New York: Holt, Rinehart, and Winston.
- Lee, V. E., & Smith, J. B. (1997). High school size: Which works best and for whom? *Educational Evaluation and Policy Analysis*, 19 (3), 205–227.
- Levitt, B. L., & March, J. G. (1996). In M. D. Cohen & L. S. Sproull (Eds.), *Organizational learning* (pp. 516–540). Thousand Oaks, CA: Sage.
- Meijer, C., & Foster, S. (1988). The effect of teacher self-efficacy on referral chance. *Journal of Special Education*, 22, 378–385.
- Newman, F. M., Rutter, R. A., & Smith, M. S. (1989). Organizational factors that affect school sense of efficacy, community and expectations. *Sociology of Education*, 62, 221–238.
- Pajares, F. (1996a, April). *Current directions in self research: Self-efficacy*. Paper presented at the annual meeting of the American Educational Research Association, New York.
- Pajares, F. (1996b, April). *Assessing self-efficacy beliefs and academic outcomes: The case for specificity and correspondence*. Paper presented at the annual meeting of the American Educational Research Association, New York.
- Pajares, F. (1997). Current directions in self-efficacy research. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement* (pp. 1–49). Greenwich, CT: JAI Press.
- Porter, G. (1992). *Collective efficacy and esteem: Measurement and study of "self" attributes at a group level*. Unpublished doctoral dissertation, The Ohio State University.
- Putnam, R. D. (1993). *Making democracy work: Civic traditions in modern Italy*. Princeton, NJ: Princeton University Press.
- Rokeach, M. (1960). *The open and closed mind*. New York: Basic Books.

- Ross, J. A. (1992). Teacher efficacy and the effect of coaching on student achievement. *Canadian Journal of Education*, 17 (1), 51–65.
- Ross, J. A. (1994, June). *Beliefs that make a difference: The origins and impacts of teacher efficacy*. Paper presented at the annual meeting of the Canadian Association for Curriculum Studies.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80, 1–28.
- Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday.
- Sirotnik, K. A. (1980). Psychometric implications of the unit of analysis problem (with examples from the measurement of organizational climate). *Journal of Educational Measurement*, 17, 245–282.
- Tschannen-Moran, M., Woolfolk Hoy, A., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, 68, 202–248.
- Woolfolk, A., & Hoy, W. K. (1990). Prospective teachers' sense of efficacy and beliefs about control. *Journal of Educational Psychology*, 82, 81–91.
- Zielinski, A. W., & Hoy, W. K. (1983). Isolation and alienation in elementary schools. *Educational Administration Quarterly*, 19 (2), 27–45.

Manuscript received January 14, 1999

Revision received September 16, 1999

Accepted November 10, 1999